Oct. 13, 1964 H. W. HOFF, JR 3,152,480

INSTRUMENT CASING

Filed Aug. 27, 1962

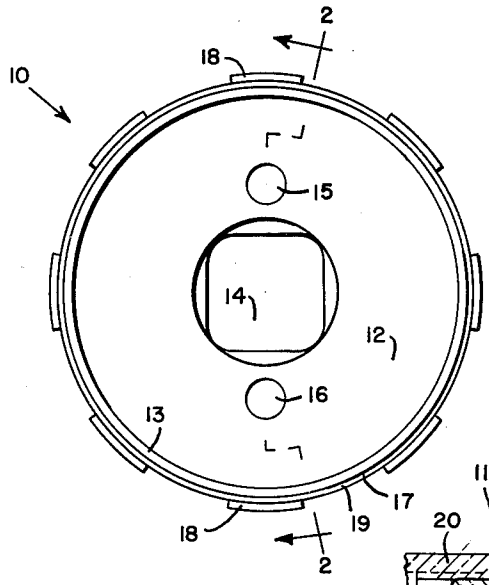


FIG. 1

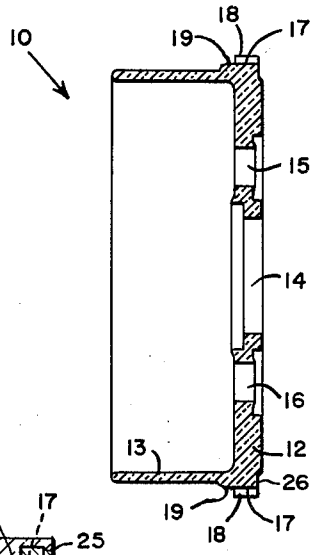


FIG. 2

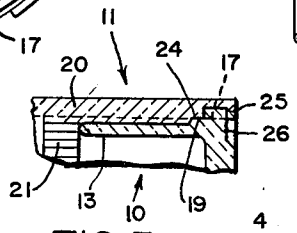


FIG. 5

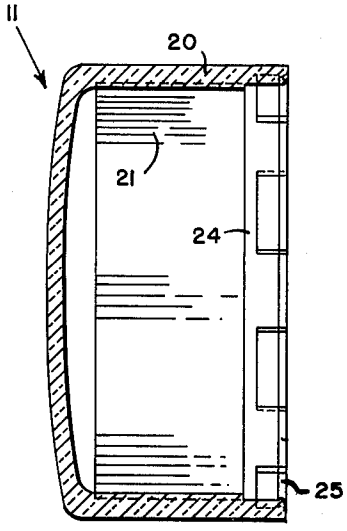


FIG. 4

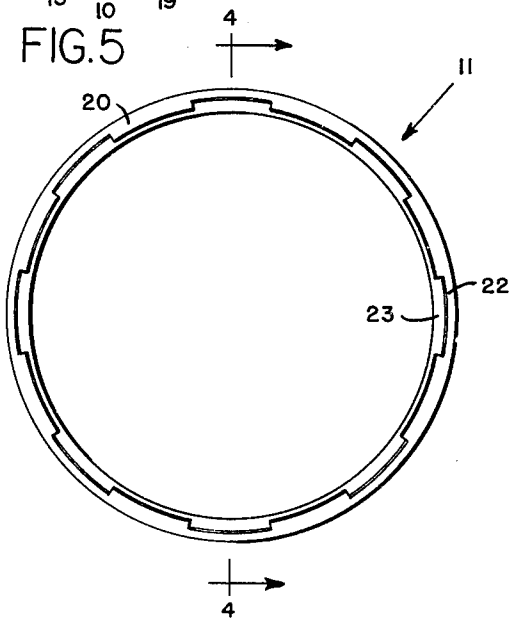


FIG. 3

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INSTRUMENT CASING

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The present invention relates to gauges, and particularly to a new and improved cover case and backplate for a gauge such as a pressure gauge or the like.

Many demands are required of gauges in modern industry. To mention only one, a problem arose in which the cover case and backplate of a pressure gauge were required to make a 100 percent seal against leakage under one foot of water for two hours at a water temperature of 95° F.; survive a 240-hour salt spray test of 20 percent sodium chloride solution; and permit separation of the cover case from the backplate when a pressure of ten pounds per square inch is generated within the case, so that should the pressure-sensitive element of the gauge leak, the cover case and backplate will separate, relieving any substantial buildup of pressure therein.

The principal object of the present invention is to provide a cover case and backplate having a snap connection between them, facilitating their ready separation.

Another object of the invention is to provide such a cover case and backplate in which the snap connection is such as to prevent relative turning between the cover case and backplate.

Still another object of the invention is to provide such a cover case and backplate in which the snap connection will provide a 100 percent seal against leakage when the assembly is submerged in water.

Still another object of the invention is to provide such a cover case and backplate which will be capable of withstanding a saline spray for an extended period of time.

Still another object of the invention is to provide such a cover case and backplate assembly which will separate upon the buildup of a relatively low pressure therein.

The above, other objects and novel features of the invention will become apparent from the following specification and accompanying drawing which is merely exemplary.

In the drawing:

FIG. 1 is a plan view of a backplate to which the principles of the invention have been applied;

FIG. 2 is a sectional view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a plan view of a cover case for assembly with the backplate of FIGS. 1 and 2;

FIG. 4 is a sectional view taken substantially along line 4—4 of FIG. 3; and

FIG. 5 is an enlarged fragmentary sectional view of the assembled cover case and back plate.

Referring to the drawing, the principles of the invention are shown as applied to a backplate **10** and a cover case **11** therefor. Both of these elements are preferably made from a thermoplastic such as a polycarbonate resin. The backplate **10** may comprise a plate element **12** having a thin, upstanding wall **13** spaced slightly inwardly from its outer peripheral edge. The center of the plate **13** may include a transverse passage **14** for the reception of fitting means adapted to connect gauge mechanism (both not shown) within the assembled cover and backplate to a source exteriorly of the casing, the value of which is to be measured. Other holes **15** and **16** may be provided in plate **10** for receiving fastening means to attach the gauge mechanism within the assembly to the backplate **10**.

The wall **13** forms with the outer peripheral edge of

plate **10** a relatively narrow, cylindrical surface **17** of slightly greater diameter than the outside diameter of the wall **13**. This narrow, cylindrical surface **17** may have formed on it spaced keys **18**. The width of keys **18** is slightly less than that of the narrow surface **17**, thus providing an uninterrupted cylindrical sealing surface **19** completely surrounding the plate element **12** for a purpose to be described later.

The cover case **11** may comprise a tubular element **20** having one of its ends closed and its side wall provided with serrations **21** internally or externally thereof. In the embodiment disclosed, the serrations **21** are formed on the inner surface of the tubular element **20**. The edge **22** of cover case **11** may be provided with spaced keyways **23** formed on the inner surface of the tubular element **20** and having dimensions and being spaced such that they register, and make a snap connection with the keys **18** on the backplate **10**. The dimension of the keyways **23** parallel to the longitudinal axis of the element **20** is such that a narrow, uninterrupted, annular band **24** extends about the inner surface of tubular element **20** between the ends of the keyways **23** and the one ends of the serrations **21**. The band **24** is adapted to make a continuous, uninterrupted seal with the sealing surface **19** on the backplate **10**.

In order to effect a snap action between the backplate **10** and the inner surface of the tubular element **20**, the latter is provided with an inwardly extending bead **25** of a radius in the embodiment disclosed in the order of about 0.010 inch at the open end of element **20**. This bead **25** extends along the keyways **23** as well as along the surfaces extending between said keyways.

The cover case **11** is preferably made from clear, transparent plastic while the backplate **10** and wall **13** are preferably made from a non-transparent colored plastic, which combines with the translucent effect of the serrated side wall of the tubular element **20** to produce a more concentrated image of the face of the dial within said cover.

The seal produced by the mating of the continuous uninterrupted surfaces **19** on the backplate **10** and **24** between the keyways **23** and the end of the serrations **21** on the cover case **11** is such that the cover case **11** will separate from the backplate **10** should a pressure within the assembly exceed a safe limit in the order of about ten pounds per square inch. In this way, there is no danger of the assembly confining excessive pressures in the event of a leak developing in the pressure-sensitive mechanism therein.

The sealing also could be accomplished or augmented by placing a suitable plastic or composition in the well **26** at the back of the gauge. The well is formed by the rear face of the back plate **10** lying inwardly of the rearmost surface of the cover **11** such that bead **25** assists in retaining the back plate in place. The well will accept a liquid or similar sealant without running over the sides of the case.

Although the various features of the new and improved cover casing and backplate have been shown and described in detail to fully disclose one embodiment of the invention, it will be evident that changes may be made in such details and certain features may be used without others without departing from the principles of the invention.

What is claimed is:

1. In a gauge casing, a backplate having a plurality of keys on the peripheral edge thereof of a width providing a continuous uninterrupted annular surface surrounding said peripheral edge, a cover case cooperating with said backplate, said cover case being tubular in form and closed at one end thereof, the open end of said tubular case including keyways formed on the inner

surface of said tubular case and of a width providing a continuous uninterrupted annular surface surrounding the inner periphery of said tubular cover case, said backplate and said cover case being arranged in cooperating position such that the keys and keyways register when the backplate and cover case are forced together, the two annular surfaces cooperating to provide a tight seal between the backplate and said cover case, and bead means between said backplate and cover case for providing a snap connection between the two.

2. In a gauge casing, a backplate having a plurality of keys on the peripheral edge thereof of a width providing a continuous uninterrupted annular surface surrounding said peripheral edge, an annular flange of less diameter than that of said continuous annular surface extending from said backplate, and a cover case cooperating with said backplate, said cover case being tubular in form and closed at one end thereof, the open end of said tubular case including keyways formed on the inner surface of said tubular case and of a width providing a continuous uninterrupted annular surface surrounding the inner periphery of said tubular cover case, said backplate and said cover case being arranged in cooperating position with said backplate closing said open end of said tubular case, and with the keys and keyways in registration when the backplate and cover case are forced together.

3. In a gauge casing, a backplate having a plurality of keys on the peripheral edge thereof of a width providing a continuous uninterrupted annular surface surrounding said peripheral edge, an annular flange of less diameter than that of said continuous annular surface extending from said backplate, and a cover case cooperating with said backplate, said cover case being tubular in form, having a serrated side wall and closed at one end thereof, the open end of said tubular case including keyways formed on the inner surface of said tubular case and of a width providing a continuous uninterrupted annular surface surrounding the inner periphery of said tubular cover case, said backplate and said cover case being arranged in cooperating position with said backplate closing said open end of said tubular case with said annular surfaces facing one another, and with the keys and keyways in registration when the backplate and cover case are forced together.

4. In a gauge casing, a backplate having a plurality of keys on the peripheral edge thereof of a width providing a continuous uninterrupted annular surface surrounding said peripheral edge, an annular flange of less diameter than that of said continuous annular surface extending from said backplate, a cover case cooperating with said backplate, said cover case being tubular in form, having a serrated side wall and closed at one end thereof, the open end of said tubular case including keyways formed on the inner surface of said tubular case and of a width providing a continuous uninterrupted annular surface surrounding the inner periphery of said tubular cover case, said backplate and said cover case being arranged in cooperating position such that the keys and keyways register when the backplate and cover case are forced together, the two annular surfaces cooperating to provide a tight seal between the backplate and said cover case, and bead means between said backplate and cover case for providing a snap connection between the two.

5. In a gauge casing, a backplate made from a polycarbonate resin and having a plurality of keys on the peripheral edge thereof of a width providing a continuous uninterrupted annular surface surrounding said peripheral edge, and a cover case made from a polycarbonate resin and cooperating with said backplate, said cover case being tubular in form and closed at one end thereof, the open end of said tubular case including keyways formed on the inner surface of said tubular case and of a width providing a continuous uninterrupted annular surface surrounding the inner periphery of said tubular cover case, said backplate and said cover case being arranged in cooperating position with said backplate closing said open end of said tubular case with said annular surfaces facing one another, and with the keys and keyways in registration when the backplate and cover case are forced together.

6. In a gauge casing, a backplate having a plurality of keys formed on the peripheral edge thereof, and a cover case adapted to cooperate with said backplate, said cover case being tubular in form and closed at one end thereof, the open end of said tubular case including circumferentially spaced keyways formed on the inner surface of said tubular case, and an inwardly extending bead means at the outer edge of said inner surface, said backplate and said cover case being arranged in cooperating position such that the keys and keyways register when the backplate and cover case are forced together over said bead means with a snap action, and the assembled cover case and backplate can be rotated while a force resists rotation of the backplate without relative rotation occurring between said cover case and backplate.

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